ORIGINAL RESEARCH PAPER

Volume-9 | Issue-2 | February-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISON BETWEEN AIRWAY NERVE BLOCKS VIS-À-VIS SPRAY-AS-YOU-GO TECHNIQUE FOR AWAKE NASOTRACHEAL INTUBATION IN ANTICIPATED DIFFICULT AIRWAY USING PORTABLE FIBRESCOPE

Anaesthesiology

Maj (Dr) Shayam P Panjiyar Graded Specialist, Anesthesiology, 158 Base Hospital, Bagdogra, Distt- Darjeeling, PIN-734014, West Bengal, India

Maj (Dr) Abhishek Shrivastava* Graded Specialist, Anesthesiology, Military Hospital, Fatehgarh, Distt- Farrukhabad, PIN-209601, Uttar Pradesh, India *Corresponding Author

ABSTRACT

Introduction: The purpose of this study was to evaluate the efficacy of portable fibrescope in awake nasotracheal intubation for patients with anticipated difficult airway and to compare the use of combined nebulised lignocaine with Airway nerve blocks with nebulised lignocaine with spray- as- you- go technique in an attempt to compare ease of intubation and patient comfort in two accepted forms of airway anaesthesia for nasotracheal intubation in awake subjects with anticipated difficult airway undergoing surgery.

Material And Methods: The study was carried out in tertiary care level hospitals affiliated to our institution. It was a longitudinal observational study to determine the time taken to intubation using two different techniques of airway anaesthesia viz Nerve blocks vis-à-vis Spray-as-you-go technique.

Result: In our study overall patient comfort was better in Group NB with fewer incidences of unpleasant recalls as compared with Group SG. However, there was no statistically significant difference for quality of airway anaesthesia for intubation between groups. No difference for patient perception of discomfort during intubation.

KEYWORDS

Awake fiberoptic intubation, Group SG, Group NB

INTRODUCTION

Difficult intubations contribute to considerable morbidity and mortality in anaesthesia.[1] Complications of difficult airways range from upper airway soft tissue trauma to hypoxic brain damage and death.[2] Fiberoptic intubation (FOI) is an effective technique for establishing airway access in patients with both anticipated and unanticipated difficult airways. Nasotracheal fiberoptic intubation is the best option where oral route is impossible. It has certain advantages such as the route to larynx is easier than mouth and also the patient is unable to bite the scope.[3] The nasal route provides an easier view of the laryngeal opening as a result of decreased interference from the tongue. In addition, the gag reflex is less pronounced with nasal intubation than with oral intubation.[4] Portable fibrescopes (Ambu® aScop2 (aScope2) are new disposable flexible videoscope, which have several advantages compared with the reusable devices. The purpose of this study was to evaluate the efficacy of this device in awake nasotracheal intubation for patients with anticipated difficult airway and to compare the use of combined nebulised lignocaine and Airway nerve blocks with nebulised lignocaine and spray- as- you- go technique in an attempt to compare ease of intubation and patient comfort in two accepted forms of airway anaesthesia for nasotracheal intubation in awake subjects with anticipated difficult airway undergoing surgery. The data pertaining to these two techniques in our settings are scanty. The purpose of this study was to compare these two techniques of airway anaesthesia for awake fibrescope guided intubation used in our hospital.This study was aimed at comparing the time taken for intubation in anticipated difficult airway with two different airway anaesthesia techniques and also haemodynamic parameters and patient comfort in both groups.

MATERIAL AND METHODS

After approval from the Institutional Ethical Committee, all patients between 18 to 60 years of age of both sex, ASA physical status I-II with anticipated difficult airway for elective surgery requiring awake fibrescope intubation under General Anaesthesia were studied. The study was conducted from Jan 2017 to Jun 2018. The study was carried out in tertiary care level hospitals affiliated to our institution. It was a longitudinal observational study to determine the time taken to intubation using two different techniques of airway anaesthesia viz Nerve blocks vis-à-vis Spray-as-you-go technique. Written informed consent was obtained from all patients before participation. The procedure of fibrescope awake intubation was explained to the patients during their preanaesthetic visit. Uncooperative patients, those allergic to LA, asthmatics, epileptics and those with deranged coagulation, haemodynamic instability, bradyarrythmias or infection at the local site were excluded from the study. Patients were randomly allocated by computer generated random numbers into two groups of 25 each. Group **NB (n = 25)** received Airway nerve blocks (bilateral superior laryngeal nerve block and transtracheal block) after nebulisation with 4% lignocaine and Group **SG (n = 25)** received topical spray of local anesthetic on site via Ambuscope channel after nebulisation with 4% lignocaine.

Awake nasotracheal intubation carried out in both the groups while recording haemodynamic parameters . Patients assessed for comfort levels, recall, in the post operative period about the procedure. Patient age, weight, height and body mass index were recorded . In the operative room, Standard monitoring including ECG, Spo2 and NIBP were applied to all the patient and the vital parameters were recorded at baseline, and every 3 min thereafter. All patients were premedicated with Inj Ondansetron 4 mg IV, and Inj Glycopyrrolate 0.2 mg intravenously (IV) to reduce the secretions of airways and xylometazoline drops (3 drops in each nostril) 15 min before airway manipulation. Nasal mucosa anaesthetised with 4% lignocaine and both nostrils packed with pledgets of cotton soaked in phenylephrine (4% lignocaine and 1% phenylephrine at a ratio of 3:1). Inj Midazolam 0.02 - 0.03 mg/kg IV and Inj Fentanyl 1 ug/Kg given on table just prior to awake nasotracheal intubation. Supplemental oxygen was administered using nasal prongs.

NB group received bilateral superior laryngeal nerve block and transtracheal block while the **SG** group received 1 ml aliquots of 2% Lignocaine through the working channel of the flexible videoscope. Vital parameters recorded at 1 and 3 mins post intubation and at 5 min intervals. With the patients in supine position, intubation was performed by an experienced Anaesthesiologist with minimum one year experience. The cord of the a Scope was inserted through the nostril and advanced into the nasopharynx till the vocal cords were visualized. Then, a lubricated nasal tube, which had been mounted and fitted on the scope beforehand, was glided over the video scope and advanced through the vocal cords into the trachea. After successful passage of the tube through the vocal cords into the trachea and after identification of the carina, the tube was positioned approximately 3 cm above the carina which corresponds to the mark of 26–28 cm at the nares, then the scope was withdrawn and the cuff of the tube was inflated and the tube was sealed with adhesive tape.

Correct placement of the tube was confirmed by the end-expiratory CO_2 curve on capnography and by bilateral auscultation. Immediately After securing the airway, General anesthesia administered using Propofol 2 mg/kg IV and Atracurium 0.6mg/kg IV and mechanical ventilation established. During the procedure, patients were awake. If it was necessary, facilitating techniques such as head flexion, and jaw thrust were utilized. In addition to the parameters of the airway

assessment like mouth opening, Mallampati class, neck movement, and thyromental distance, the time from the start of insertion of the a Scope in the nares till visualization of vocal cords (Tvc) and from this till successful endotracheal intubation and cuff inflation (Tti), then the total time of nasotracheal intubation which is the sum of the previous two times were recorded in seconds.. The number of attempts, the need of facilitating maneuvers, the incidence of esophageal intubation or any complications and success rate were recorded. Intubation was considered failed if desaturation (S_pO_2 < 95%) occurred before identification of the carina in spite of the precautions taken to provide oxygen.

STATISTICALANALYSIS:

Demographic parameters like gender, ASA physical status, MPCL ,Mouth opening,neck movement, thyromental distance, co-morbidities in study population were analysed using Chi-square test. Age , height , weight , heart rate , SBP ,DBP ,SPO2 were presented using mean and standard deviation and were compared using 2 independent sample t-test. Non numerical data like time to vocal cord visualization ,time to tracheal intubation, total time of nasotracheal intubation were analysed using Mann-Whitney test. Statistical analysis was performed with SPSS, version 23 (IBM Corp., USA). Values considered statistically significant if $p < 0.05$.

RESULTS

Demographic data[Table 1] were similar between the two groups. No statistically significant differences were found between the two groups regarding age, sex, weight, height, body mass index (BMI) and ASA class as well as the parameters of the airway assessment. There was no significant difference found between the two groups regarding the time to vocal cord visualization (Tvc) , the time of tracheal intubation (Ti) as well as the total time of nasotracheal intubation. The total time of nasotracheal intubation in our study was 182.88 ± 43.01 sec in NB group and 193.92 ± 45.12 sec in SG group.

In our study overall patient comfort was better in Group NB with fewer incidences of unpleasant recalls as compared with Group SG. Group SG had an increased number of coughing/gagging episodes as compared with Group NB. Vocal cord visibility and ease of intubation were better in patients who received airway blocks and hence the amount of supplemental lignocaine used was less in this group. However there was no statistically significant difference for quality of airway anaesthesia for intubation between groups. No difference for patient perception of discomfort during intubation.

Table 1. Demographic Profile of the studied groups (data expressed as Mean ±SD or number and percentage).

Variable	Group NB (n= 25)	Group SG (n =25)	P value
Age (yrs)	38.16 ± 13.92	33.32 ± 9.23	0.15
Sex(male/female)	19/6	18/7	0.99
Weight (kg)	63.40 ± 13.52	58.64 ± 11.58	0.18
Height (cm)	166.64 ± 5.84	166.28 ± 5.51	0.82
ASA(I/II)	16/9	12/13	0.39

No significance difference p-value > 0.05.

Table 2. Airway Assessment in the studied groups (data expressed as number and percentage).

Variable	Group NB (n =25)	Group SG (n= 25)	P value
Mallampati class			
Class II	2 (8%)	3 (12%)	0.51
Class III	17(68%)	13(52%)	
Class IV	6 (24%)	9(36%)	
Mouth opening			
< 4 cm	22(88%)	24(96%)	0.61
> 4 cm	3(12%)	1(4%)	
Neck movement			
< 80	3 (12%)	2(8%)	0.24
80-90	3(12%)	8(32%)	
>90	19(76%)	15(60%)	
Thyromental distance			
< 6 cm	6(24%)	7 (28%)	0.87
6-6.5 cm	7(28%)	5(20%)	
> 6.5 cm	12(48%)	13(52%)	

Table 3. Times of nasotracheal intubation (data expressed as mean ± SD).

Variable	Group NB (n= 25)	Group SG (n =25)	P Value
Time to VC visualization (s)	54.88 ± 29.87	60.68 ± 26.71	0.69
Time to Ti (s)	128.00 ± 48.13	133.24 ± 46.69	0.26
Total time of nasotrach. (s)	182.88 ± 43.01	193.92 ± 45.12	0.19

Time to vc=time to vocal cord visualization
Time to Tti=time to tracheal intubation.
Total time of nasotrach.= Total time of nasotracheal intubation.
Significant difference p-value < 0.05.

DISCUSSION

A major challenge for awake fibreoptic tracheal intubation is to ensure that the procedure is comfortable for the patient. This requires a combination of conscious sedation and topical anaesthesia. For topical anaesthesia, the spray-as-you-go technique with classical bolus application of local anaesthetic is a commonly used method [5].

Awake fiberoptic bronchoscope (FOB) guided intubation is a safe approach to airway management in most cases of difficult airway, especially in patients with cervical spine injury. It is essential to sufficiently anesthetize the upper airway and suppress the gag, swallow and cough reflexes prior to awake FOB guided intubation and thus ensure patient comfort.[6] This can be achieved in multiple ways, which can broadly be divided into two groups: (a) Topical administration of local anesthetic (LA), or (b) blockade of neural supply to oropharynx and larynx.

Our results are similar to the randomized double-blinded study conducted in 1995 by Reasoner *et al*.[5] which compared nebulized lignocaine with airway blocks to aid in FOB guided intubation in patients with cervical spine instability. The time required for laryngoscopy and intubation was similar between groups (topical anesthesia group = 192 ± 174 sec ; nerve block group = 192 ± 114 sec).

Our results are similar with Kundra *et al*.[6] who compared two methods of anesthetizing the airway for awake fiberoptic nasotracheal intubation. One of the groups received 4 ml of 4% lignocaine through nebulization and the other received airway blocks (translaryngeal, bilateral superior laryngeal and lignocaine soaked cotton swabs in the nose). The time taken to intubate was similar in both groups.

In our study, vocal cord visibility and ease of intubation as assessed by the Anaesthesiologist were better in the nerve block group as compared with the nebulization group. This finding is similar to that observed by Graham *et al*.[7] They reported that the bronchoscopist preferred transtracheal instillation of LA as compared to LA nebulization or LA instillation through the working port of FOB. However, Reasoner *et al*.[5] did not find any difference in the quality of airway anesthesia between nebulized LA and nerve blocks as assessed by a blind observer/bronchoscopist.

Our results are contradictory to Babita Gupta *et al [8]*conducted a randomized controlled study on Topical airway anesthesia for awake fiberoptic intubation: Comparison between airway nerve blocks and nebulized lignocaine by ultrasonic nebulizer in 2016 .This study found that no significant differences in demographics or hemodynamic parameters at any time during the study. However, the time taken for intubation was significantly lower in Group NB . The time taken to perform FOB guided intubation was 123.0 ± 46.7 sec in NB group as compared with group L 200.4 ± 72.4 sec . This was probably because group NB received airway block along with viscous xylocaine gargles twice and the intubation was orotracheal. Our results are similar to this study in respect of Vocal cord visibility and ease of intubation. Vocal cord visibility and ease of intubation were better and Overall patient comfort was better in Group NB as compared with the Group L.

In our study the total time of nasotracheal intubation is more in NB group (182.88 ± 43.01 sec) group as compared to a study done by Chatrath V, Sharan R, Jain P, Bala A, Ranjana, Sudha in 2016.[9] They conducted a observational study on the efficacy of combined regional nerve block in awake orotracheal fibreoptic intubation, 50 patients of ASA Grade I-II were given nerve blocks - bilateral glossopharyngeal nerve block, B/L SLN block, and RLN block before awake fiberoptic intubation using 2% lidocaine. The mean time taken for FOB guided endotracheal intubation was 127.2 ± 7.2 sec in this study. This was probably because they have given additional glossopharyngeal nerve

block apart from B/L SLN block and transtracheal RLN block and the intubation was orotracheal.

The total time of nasotracheal intubation taken in SAGO technique (193.92 ± 45.12 sec) in our study was similar to a study done by Omyma Shehata Mohamed Khalifa.[10] They conducted A randomized controlled trial on evaluation of Ambu® aScope™ 2 in awake nasotracheal intubation in anticipated difficult airway using conventional or facilitated technique in the period from 2013 on 50 patients, underwent elective maxillofacial surgery under general anesthesia with an anticipated difficult airway requiring nasotracheal intubation as the oral route was impossible.The total time of nasotracheal intubation was 244.8 ± 1.15 sec in conventional group.

LIMITATIONS

The aScope was not compared to the standard fiberscope to clarify the performance of each. We did not evaluate the efficiency of the device in the unanticipated difficult airway. The deep palpation of hyoid bone can be uncomfortable to the patient and is difficult in patients who have a short or thick neck, with higher failure rates.

CONCLUSION

A properly performed technique of awake fiberoptic intubation done under combined regional nerve blocks or Spray-As-You-Go airway topical anesthesia provides good intubating conditions, patient comfort and safety and results in minimal hemodynamic changes. Both techniques for airway anesthesia were found to be similarly safe and effective and offer alternatives when one of these two techniques is not feasible.

REFERENCES

1. Peterson GN, Domino KB, Caplan RA, Posner KL, Lee LA, Cheney FW. Management of the difficult airway: a closed claims analysis. Anesthesiology 2005;103:33–9.
2. Gannon K. Mortality associated with anaesthesia. A case review study. Anaesthesia 1991;46:962–6.
3. Lavery GG, Mc Closekey BV. The difficult airway in adult critical care. Crit Care Med 2008;36(7).
4. Machata AM, Gonano C, Holzer A, et al. Awake nasotracheal fiberoptic intubation: patient comfort, intubating conditions, and hemodynamic stability during conscious sedation with remifentanil. Anesth Analg 2003;97:904–8.
5. Reasoner DK, Warner DS, Todd MM, Hunt SW, Kirchner J. A comparison of anesthetic techniques for awake intubation in neurosurgical patients. J Neurosurg Anesthesiol 1995; 7: 94-9.
6. Kundra P, Kutralam S, Ravishankar M. Local anaesthesia for awake fibreoptic nasotracheal intubation. Acta Anaesthesiol Scand 2000; 44: 511-6.
7. Graham DR, Hay JG, Clague J, Nisar M, Earis JE. Comparison of three different methods used to achieve local anesthesia for fiberoptic bronchoscopy. Chest 1992; 102: 704-7.
8. Gupta B, Kohli S, Farooque K, Jalwal G, Gupta D, Sinha S, C. Topical airway anesthesia for awake fiberoptic intubation: Comparison between airway nerve blocks and nebulized lignocaine by ultrasonic nebulizer. Saudi J Anaesth 2014;8:15-9.
9. Chatrath V, Sharan R, Jain P, Bala A, Ranjana, Sudha. The efficacy of combined regional nerve blocks in awake orotracheal fiberoptic intubation. Anesth Essays Res 2016;10:255-61.
10. Shehata O, Khalifa M. Evaluation of Ambu® aScope™ 2 in awake nasotracheal intubation in anticipated difficult airway using conventional or facilitated technique : A randomized controlled trial. Egyptian J Anaesthesia 2015;31:269-275.